IN THE CLAIMS:

Please amend the claims as follows:

Claim 1 (Currently Amended): A photonic network packet routing method comprising:

~~a step of~~ optically encoding destination address information attached to an IP packet using light attributes,

~~a step of~~ discriminating the encoded address information of the IP packet by optical correlation processing,

~~a step of~~ switching to an output path for the IP packet based on a result of the ~~discrimination~~ discriminating step, and

~~a step of~~ outputting the IP packet labeled with prescribed address information on the output path selected by the switching step.

Claim 2 (Currently Amended): A packet routing method according to claim 1, wherein the optical encoding of the destination address information attached to the IP packet ~~is conducted by~~ comprises:

dividing an optical pulse output by a pulse source into N number of chip pulses ($N \geq 2$) having a prescribed delay time therebetween, and

imparting the individual chip pulses with phase shifts of "0" or "π" relative to a light carrier phase of the chip pulses, and recombining the divided optical chip pulses.

Claim 3 (Currently Amended): A packet routing method according to claim 1, wherein the optical encoding of the destination address information attached to the IP packet ~~is conducted by~~ comprises:

dividing an optical pulse output by a pulse source into N number of chip pulses ($N \geq 2$) having a prescribed delay time therebetween,

changing normalized intensity of the individual chip pulses to "1" or "0", and

recombining the divided optical chip pulses.

Claim 4 (Currently Amended): A packet routing method according to claim 1, wherein discrimination of the optically encoded address information ~~is conducted by~~ comprises:

sending the IP packet labeled with address information onto a number of arms equal to the number of address entries, and

simultaneously conducting optical correlation processing on all arms in parallel.

Claim 5 (Currently Amended): A packet routing method according to claim 1, wherein discrimination of the encoded address information by optical correlation processing ~~is conducted by~~ comprises:

subjecting optical chip pulses to matched filtering,

effecting threshold processing on a center peak value of a generated autocorrelation function, and

optically regenerating the obtained "0" or "1".

Claim 6 (Currently Amended): A packet routing method according to claim 1, further comprising ~~a step of~~ :

subjecting an output of an optical decoder to time gate processing, when subjecting a center peak value of a correlation function to threshold processing, thereby cutting off a center part and eliminating ~~side-lopes~~ side-lobes of a correlation waveform, and ~~a step of~~

conducting threshold processing.

Claim 7 (Currently Amended): A packet routing method according to claim 1, further comprising ~~a step of~~ :

dividing an IP packet having encoded address information in two, ~~a step of~~

conducting optical correlation processing to discriminate address information from an optical code in one IP packet containing address information between the two divided IP packets, ~~a step of~~

selecting an output path based on a result of the discrimination, and ~~a step of~~

outputting the other divided IP packet on the selected output path.

Claim 8 (Original): A packet routing method according to claim 6, wherein the address information is discriminated by sending the one IP packet onto a number of arms equal to the number of output paths and simultaneously conducting optical correlation processing on all arms in parallel.

Claim 9 (Original): A packet routing method according to claim 7, wherein an optical code in the one packet is discriminated by optical correlation processing, the discriminated signal is converted to an electric signal, and a gate of a prescribed output path is opened by the electric signal.

Claim 10 (Original): A packet routing method according to claim 7, wherein an optical code in the one packet is discriminated by optical correlation processing and an optical switch of a prescribed output path is turned ON by the discriminated optical signal.

Claim 11 (Currently Amended): A packet routing method according to claim 1, further comprising ~~a step of~~ :

combining the IP packet output on the prescribed path and a pulse signal for control adjusted to generate an optical pulse ~~at a portion where it is desired~~ to convert the optical code, and ~~a step of~~

converting the combined signal into a prescribed optical code by cross-phase conversion.

Claim 12 (Currently Amended): A packet router for a photonic network comprising:

encoding means for encoding by use of light attributes including destination address information attached to an IP packet,

branching means for sending the IP packet having the encoded destination address information onto two paths,

address processing means for subjecting one IP packet received from the branching means to optical correlation processing and outputting a switch control signal based on a result of the discrimination, and

switch means for selectively outputting the packet by switching an output path of the other packet received from the branching means based on the address control signal from the address processing means.

Claim 13 (Currently Amended): A packet router according to claim [[11]] 12, wherein the encoding means comprises:

multiple tunable taps ~~for dividing~~ configured to divide a light pulse output by a pulse source into a prescribed number of optical chip pulses,

optical phase shifters ~~for imparting~~ configured to impart phase shifts of "0" or "π" to each divided chip pulse, and

a combiner ~~for recombining~~ configured to recombine the divided optical chip pulses.

Claim 14 (Currently Amended): A packet router according to claim [[11]] 12, wherein the encoding means comprises:

multiple tunable taps ~~for dividing~~ configured to divide a light pulse output by a pulse source into a prescribed number of optical chip pulses,

gate switches ~~for changing~~ configured to change an optical intensity of the chip pulses to "1" or "0", and

a combiner ~~for recombining~~ configured to recombine the divided optical chip pulses.

Claim 15 (Currently Amended): A packet router according to claim [[11]] 12, wherein the address processing means comprises:

means for sending the one IP packet sent onto one path by the branching means onto a number of arms equal to the number of addresses, and

a decoder provided on the individual arms ~~for outputting~~ configured to output a switch control signal when the decoder's own code and the code of IP packet coincide.

Claim 16 (Currently Amended): A packet router according to claim [[14]] 12, wherein the switch means comprises:

means for sending the other IP packet sent onto the other path by the branching means onto a number of arms equal to the number of output ports, and

an optical gate provided on each arm that opens in response to a switching control signal from the decoder to output the IP packet onto the arm.

Claim 17 (Currently Amended): A packet router according to claim [[11]] 12, further comprising:

a combiner ~~for combining~~ configured to combine an IP packet output through a prescribed path with a pulse signal for control, adjusted to generate an optical pulse ~~at a portion where it is desired~~ to convert the optical code, and

a nonlinear optical medium ~~for converting~~ configured to convert the combined signal into a prescribed optical code by cross-phase conversion.

Claim 18 (New): A packet routing method according to claim 1, wherein the light attributes are wavelengths, phases, or amplitudes of light.

Claim 19 (New): A packet routing method according to claim 1, wherein the step of discriminating is performed by optical processing in time domain.

Claim 20 (New): A packet router according to Claim 12, wherein the light attributes are wavelengths, phases, or amplitudes of light.

Claim 21 (New): A packet router according to Claim 12, wherein the address processing means subjects the one IP packet to optical processing in time domain.